Scientific Museum.

Tanning--Practical Remarks.

The articles, "Practical Remarks on Tanning" are furnished by one of the most ingenious, experienced, and largest leather manufacturers in our country. They will be continued, so as to describe the whole process, but if there be some interruptions in the regularity of their publication, our readers will bear with us.

Results of some Experiments on the Explosion of Burning Fluids.

READ BEFORE THE AMERICAN ACADEMY OF ARTS AND SCIENCES.—BY PROF. HORSFORD.

It has been maintained, that several of the various preparations, used under the general denomination of Burning Fluids, are in certain conditions, explosive. It has been asserted, on the other hand, by venders, they are not explosive. Wherein the misapprehension lies, how the numerous accidents that have occured in the use of these preparations are to be explained, and by what precautions such accidents may be prevented, have been subjects of experimental inquiry.

The burning-fluids, as a class, are rectified spirits of turpentine, or turpentine with a mixture of a small percentage of alcohol, or of some other inflammable body readily mixing with or soluble in turpentine.

Turpentine, alcohol, ether, and the burning-fluids, when fired in an open vessel, burn at the surface as long as a supply of oxygen is kept up. A slight report attends the flash of flame at the commencement of the combustion. The accidents with burning-fluids ordinarily occur during the filling of lamps from the cans, when the chamber of space above the fluid within the can or lamp was larger, and always in the presence of flame. A mixture of hydrogen (an inflammable gas) with oxygen (an ingredient of atmospheric air), in the proportion of two volumes of the former to one of the latter, is eminently explosive. Atmospheric air, substituted for oxygen, lessens the violence of the explosion when flame is applied. The carbo-hydrogen, employed for city illuminations, may be substituted for the hydrogen, and the explosive property, somewhat impaired, be still possessed by the mixture. Certain proportions of the gases are better suited to produce violence of explosion.

It has been found that the vapor of common spirits of wine, ether, and of two varieties of burning-fluid, may severally be substituted for the hydrogen, and the explosive property remain essentially the same, though of equal energy.

In these facts, lies the explanation of the phenomena that have been observed with burning-fluids.

The following experiments were made:—

I. A current of air was directed into the upper part of a loosely stoppered laboratory glass spirit-lamp, while burning, causing, thereby, a mixture of alcohol-vapor and air to rush past the flame. After a moment or two, the jet took fire, and was instantaneously followed by explosion. This result was invariable.

II. After permitting a drop of alcohol, in a large glass flask of small neck, to evaporate for a moment, and applying flame to the mouth, explosion resulted generally, though not invariably.

III. Ether similarly treated yielded less uniform results, because, probably, of greater difficulty of obtaining the proper mixture of ether-vapor and air.

IV. A variety of burning-fluid in extensive use, said by the venders not to explode, was subjected to similar experiment, with still less frequent affirmative results. They were, however, sufficent to show that explosions with it are possible. Similar experiments have been made with another variety of burning-fluid, by Dr. Morrill Wyman, with like results.

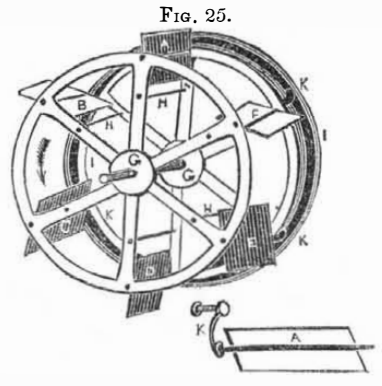
It is, then, conceivable, that, when the proper relative amounts of the vapor of burning-fluid and atmospheric air are mixed together, as they may be in the upper part of a partially filled can or lamp, and a flame is brought sufficiently near, explosion must result. If the quantity or mixed gases be large, the explosion may cause the destruction of the containing vessel, or if that remain entire, it may drive out a portion of fluid, which, taking fire, may cause more or less injury. The course of safety has been pointed out by the dealers in these articles for illumination. It is to fill the lamps (the tops of which screw on and are not supplied with special air-holes) in the absence of flame, by daylight, for example; in which case no explosion can occur.

History of Propellers and Steam Navigation.

[Continued from page 192.]

The accompanying engraving represents a plan for making the paddles enter and leave the water in a vertical position by an extra eccentric wheel moving the paddles on their axis—the axis of them passing through their centre. We are not able to tell the inventor's name, we believe, however, that it is "*Poole*," but the invention is at least twenty years old. A B C D E F are the paddles, which turn round upon their axis as the large wheel to which they are applied revolves. H H H H H are the rods to the two sides of the wheel. I I I I are the concentric rings, with an opening or groove between them, which forms the path for the crank arms, K K K K, to move in.—The centre of the guide rings being eccentric to that of the wheel, causes the paddles to assume the positions represented in the engraving, which were found to be best adapted to the motion of the vessel. The paddle C is supposed to be just dipping into the water, while D is deeply immersed, and E just rising out of it.

Fig. 25.



The small figure below the wheel is an underside perspective view of a paddle separately; K is the crank arm connected at one end to the axis, A, and at the other to the anti-friction roller before mentioned, which travels in the groove of the railway.

We have seen no less than three separate re-inventions of this paddle wheel, within two years. Two of these were invented by men who constructed models and brought them to New York, the one from St. Louis, the other from Connecticut. The other was a drawing only, made by a gentleman in New York. Had these gentlemen been acquainted with the above invention, it would have saved them much labor, study, and, consequently, expense. But what is stranger than all this, and what we would not have expected, we are informed that Mr. David Napier, of London, a first rate and one of the most experienced marine engineers in the world (not the builder of the Cunard engines), constructed a steamer with wheels like the above, in 1848. His steamboat exhibited astonishing speed, surpassing every steamboat on the Thames, but this might have been owing to (that is our opinion) some other thing than the paddle wheels, perhaps the engines, or build of the vessel. At any rate, its superior speed lasted only a few weeks, when, from the number of breakages, she had to be laid aside, and was dismantled of her new-fangled wheels. Although her speed was so great, she seldom made a trip without breaking a ring of one or both wheels, an she was totally unfit for sea navigation, from this very cause. Economy embraces, not the speed of a trip, but the number of trips in a given time, performed at the least expense.

In looking over our list of propelling contrivances, we perceive that some of them, novel in themselves, are without the names of the inventors attached to them, we must therefore just present them as they are, with the date, as near as can be found, of the invention. The great benefit that we wish to perform is to show what has been already invented, to prevent others from spending their time and money on the like projects. We have also a few communications on the subject, which will take their place in regular order.

Polar Origin of the Tides.

The source of the tides is, therefore, to be sought in the great reservoir of ocean round the Southern Pole. This polar reservoir is agitated on opposite sides by the moon in its alternate lower and upper transits, and by the sun in less degree. Here the great central agitation seems to commence, and hence on all sides it seems to flow northward. From the South Pole this great agitation flows into the Indian Ocean; and proceding northward, the great tide-wave strikes with violence on the shores of Hindostan, and finaly in the mouth of the Ganges, where it expends its force on the shores in the form of the well-known and terrific bore of the Hoogly. The Atlantic, in like manner, receives from the southern reservoir its great wave of tide, which passes northward with impetuosity, and expends its force on the shores of Britain and North America; where again it becomes the enormous steam-tide of the Bristol Channel, and the destroying surge of the Bay of Fundy, so well known to all mariners.—From the south, in like manner, the Pacific should receive its great tide, were it not barricaded out by innumerable submarine steppes, and its thousands coral reefs, and its myriads of happy islands, to whose calm seas no propagation of this great horizontal-acting wave can gain access. It is by depth and uninterrupted bottom only that a great wave like the tide can force entrance; it is only the small waves raised by a local tempest, that travel over the surface. An action like the tide, extending uniformly to all depths of the ocean, cannot be propagated on a superficial coating alone.—The tides are built out of the Pacific by submarine works, and enter it alone and with difficulty by the eastern side of America, where diffused and rapidly diminishing, the tide extends a certain way through the more open parts of the sea, continually diminishing in intensity. In the North Pacific we have neither the bores of a Hoogly nor the terrific tides of a Bay of Fundy.

Burns and Scalds.

The following article on Burns, by Dr. Reese from the Journal of Medical Sciences, is of great practical importance and will no doubt be the means of doing much good. Dr. Reese has long been superintending Physician of the Bellevue Hospital, and is very eminent in his profession.

Burns—Among the most numerous cases brought into the surgical wards of charity hospitals, everywhere, may be reckoned the injuries received by burns and scalds, which, when extensive, are too often fatal. In the treatment of these injuries we have had great experience and uniform success, when patients were brought in soon after the injury. No fatal case of recent burn has occurred in the hospital, although several have been extensive and severe. The universal treatment of all such cases is to cover the parts with wheaten flour thrown over the wounds by a dredging-box; which, if thoroughly done so as to exclude the air, and prevent its temperature from reaching the suffering tissues, will afford instant relief from pain, and allay all that nervous irritation which is the chief source of immediate danger in all cases of extensive burns. We have had opportunity to test this practice in terrible burns occasioned by explosions of gunpowder, in scalds from the bursting of steam-boilers, in examples of persons while drunk falling into the fire, and others in which the clothes were burnt off the body by the combustion of spirit gas, &c. In all these cases, and in some of them scarcely any portion of the body had escaped—and notwithstanding, in a few of them, the integuments were literally baked, so that extensive and deep-seat-supperation and sloughing were inevitable, and had afterward to be endured—the external application of the flour was in the first instance our only remedy, and this was continued for one or more days, while the acute effects of the injury demanded it.—The superficial portions of the burns or scald would often heal under this application alone; and the solutions of continuity, more or less deep, which remained open and discharging, were then dressed with lime water and oil, by means of a feather, to which creosote was added if the granulations were slow, or the sloughs tardy in becoming loose. Under this dressing the most formidable burns have been healed; and even when the face has been involved, there has been scarcely any considerable deformity. In one of our patients, the face being horribly burned by an accidental explosion of gunpowder, the grains of powder having been imbedded in the skin, very great apprehensions were indulged that the discoloration thus produced would permanently disfigure and deform the countenance. But, after the persistent application of the flour for three successive days, and until the tumefaction of the face and head had subsided, it was found that, with a few applications of the lime-water dressing, the cicatrization was complete, and even the discoloration was removed.

If this simple remedy were resorted to in the severe scalds sometimes occurring from explosions of steamboat boilers, &c. there can be little doubt that the fatality of such burns would be very rare; while the popular and mischievous methods of applying raw cotton, oil, molasses, salt, alchohol, spirits of turpentine, sugar of lead water, ice, &c. to extensive and deep burns, are, all of them, injuries, and often destructive to life.

Curious Effect of the Electric Light.

A gentleman near Waltham Abbey was experimenting a short time ago with the electric light, and having a wound in his left hand he touched the conducting wire with it, and at once he felt an irritation in his hand, and it became swollen, and his whole body was soon covered with tumors.

Duration of Life.

In M. Lombard's returns for Geneva, the average longevity of stone-cutters is stated at 34 years; sculptors, 36; millers, 42; painters, 44; joiners 49; butchers, 53; writers, 51; surgeons, 54, masons, 55; gardeners, 60; merchants, 62; Protestant clergymen, 63; and magistrates, 69 years.

One of Dodge's Patent Cop Spining Frames is spining eight and five-eighths skeins per spindle daily, (working usual time) of No. 37½ yarn, in J. C. Peckham & Co.'s mill, in East Greenwich, R. I.